

## SEQUENCE LISTING

<110> CASTANIA Sociedade Agroflorestal SA

<120> Castanea sativa Mill. genes codifying for Allene Oxide Cyclase, Cystatin, B-1,3-Glucanase and Thaumatin-Like Protein and their use

<130> 2004/01/PCT

<141> 2004-06-07

<150> PT 102979-S

<151> 2003-06-26

<160> 8

<170> PatentIn version 3.1

<210> 1

<211> 735

<212> DNA

<213> Castanea sativa

<400> 1

atg gcc act gtt tcc tca gcc tct gct gct ctt aga acc att tct tct 48  
Met Ala Thr Val Ser Ser Ala Ser Ala Ala Leu Arg Thr Ile Ser Ser  
1 5 10 15

tcc tca tcc aag cta tct tct gcc ttc caa act aaa aag atc caa tct 96  
Ser Ser Ser Lys Leu Ser Ser Ala Phe Gln Thr Lys Lys Ile Gln Ser  
20 25 30

ttt aaa cta cct aac cct ctc att tct cag aat cat aaa ctt act acc 144  
Phe Lys Leu Pro Asn Pro Leu Ile Ser Gln Asn His Lys Leu Thr Thr  
35 40 45

acc tct act act gct tcc aga tca ttt tcc tgc aag agc cag agc acc 192  
Thr Ser Thr Thr Ala Ser Arg Ser Phe Ser Cys Lys Ser Gln Ser Thr  
50 55 60

tca aca gat tca act aac act gaa gtt caa gaa ctt agt gtc tat gag 240  
Ser Thr Asp Ser Thr Asn Thr Glu Val Gln Glu Leu Ser Val Tyr Glu  
65 70 75 80

atc aat gaa cgt gat cgt gga agc cct gct tat ctt cga ttg agc caa 288  
 Ile Asn Glu Arg Asp Arg Gly Ser Pro Ala Tyr Leu Arg Leu Ser Gln  
           85              90              95

aag act gtt aat tca ctc gga gat ctt gtc ccc ttt agc aac aag cta 336  
 Lys Thr Val Asn Ser Leu Gly Asp Leu Val Pro Phe Ser Asn Lys Leu  
           100              105             110

tat act gca gat cta aag aag aga att gga ata aca gca gga ctc tgc 384  
 Tyr Thr Ala Asp Leu Lys Lys Arg Ile Gly Ile Thr Ala Gly Leu Cys  
           115              120             125

att ctg atc aag cac gaa gaa gag aag aaa gga gat cgc tat gaa gct 432  
 Ile Leu Ile Lys His Glu Glu Glu Lys Lys Gly Asp Arg Tyr Glu Ala  
           130              135             140

gtt tac agc ttc tac ttc ggc gat tac ggt cat atc gcc gtt cag gga 480  
 Val Tyr Ser Phe Tyr Phe Gly Asp Tyr Gly His Ile Ala Val Gln Gly  
           145              150             155             160

gcg tac tta acc tat gaa gaa act tac cta gcc gtc acc ggt gga tcc 528  
 Ala Tyr Leu Thr Tyr Glu Glu Thr Tyr Leu Ala Val Thr Gly Gly Ser  
           165              170             175

ggc ata ttt gca ggg gtt tcc ggt caa gtg aaa ttg cag caa ctc att 576  
 Gly Ile Phe Ala Gly Val Ser Gly Gln Val Lys Leu Gln Gln Leu Ile  
           180              185             190

ttc cct ttc aag cta ttt tac act ttt tac ttg aag ggg atc ccc ggt 624  
 Phe Pro Phe Lys Leu Phe Tyr Thr Phe Tyr Leu Lys Gly Ile Pro Gly  
           195              200             205

ctg cca tct gaa ttg ttg tgt acg gcg gtt cct ccg tcg ccg acg gtg 672  
 Leu Pro Ser Glu Leu Leu Cys Thr Ala Val Pro Pro Ser Pro Thr Val  
           210              215             220

gag cca aca cct gaa gct aaa gct tgt gag gaa ggg gcc gca ctg aaa 720  
 Glu Pro Thr Pro Glu Ala Lys Ala Cys Glu Glu Gly Ala Ala Leu Lys  
           225              230             235             240

aat tac act aat taa 735  
 Asn Tyr Thr Asn

<210> 2

<211> 244

&lt;212&gt; PRT

<213> *Castanea sativa*

&lt;400&gt; 2

Met Ala Thr Val Ser Ser Ala Ser Ala Ala Leu Arg Thr Ile Ser Ser  
1 5 10 15

Ser Ser Ser Lys Leu Ser Ser Ala Phe Gln Thr Lys Lys Ile Gln Ser  
20 25 30

Phe Lys Leu Pro Asn Pro Leu Ile Ser Gln Asn His Lys Leu Thr Thr  
35 40 45

Thr Ser Thr Thr Ala Ser Arg Ser Phe Ser Cys Lys Ser Gln Ser Thr  
50 55 60

Ser Thr Asp Ser Thr Asn Thr Glu Val Gln Glu Leu Ser Val Tyr Glu  
65 70 75 80

Ile Asn Glu Arg Asp Arg Gly Ser Pro Ala Tyr Leu Arg Leu Ser Gln  
85 90 95

Lys Thr Val Asn Ser Leu Gly Asp Leu Val Pro Phe Ser Asn Lys Leu  
100 105 110

Tyr Thr Ala Asp Leu Lys Lys Arg Ile Gly Ile Thr Ala Gly Leu Cys  
115 120 125

Ile Leu Ile Lys His Glu Glu Glu Lys Lys Gly Asp Arg Tyr Glu Ala  
130 135 140

Val Tyr Ser Phe Tyr Phe Gly Asp Tyr Gly His Ile Ala Val Gln Gly  
145 150 155 160

Ala Tyr Leu Thr Tyr Glu Glu Thr Tyr Leu Ala Val Thr Gly Gly Ser  
165 170 175

Gly Ile Phe Ala Gly Val Ser Gly Gln Val Lys Leu Gln Gln Leu Ile  
 180 185 190

Phe Pro Phe Lys Leu Phe Tyr Thr Phe Tyr Leu Lys Gly Ile Pro Gly  
 195 200 205

Leu Pro Ser Glu Leu Leu Cys Thr Ala Val Pro Pro Ser Pro Thr Val  
 210 215 220

Glu Pro Thr Pro Glu Ala Lys Ala Cys Glu Glu Gly Ala Ala Leu Lys  
 225 230 235 240

Asn Tyr Thr Asn

<210> 3

<211> 318

<212> DNA

<213> Castanea sativa

<400> 3

atg aga aaa ttg gca gca cta gtt gga gga gtg tca gat gtt aag gga 48  
 Met Arg Lys Leu Ala Ala Leu Val Gly Gly Val Ser Asp Val Lys Gly  
 1 5 10 15

cat gag aac agc ttg cag atc gac gac ctc gct cgt ttt gct gtc gac 96  
 His Glu Asn Ser Leu Gln Ile Asp Asp Leu Ala Arg Phe Ala Val Asp  
 20 25 30

gac cac aac aag aaa gcg aat aca ctg ctg cag ttt aag aag gtg gtg 144  
 Asp His Asn Lys Lys Ala Asn Thr Leu Leu Gln Phe Lys Lys Val Val  
 35 40 45

aat gcg aaa cag cag gtg gtt tct gga aca ata tac att cta acg ttg 192  
 Asn Ala Lys Gln Gln Val Val Ser Gly Thr Ile Tyr Ile Leu Thr Leu  
 50 55 60

gag gtg gag gat ggc ggg aag aag aaa gtt tat gaa gcc aag att tgg 240  
 Glu Val Glu Asp Gly Gly Lys Lys Lys Val Tyr Glu Ala Lys Ile Trp  
 65 70 75 80

gag aag cca tgg ttg aac ttc aag gag gtg cag gaa ttt aag ctc att 288  
 Glu Lys Pro Trp Leu Asn Phe Lys Glu Val Gln Glu Phe Lys Leu Ile  
 85 90 95

ggt gat gcc cct aca cac cat agt gct taa 318  
 Gly Asp Ala Pro Thr His His Ser Ala  
 100 105

<210> 4

<211> 105

<212> PRT

<213> *Castanea sativa*

<400> 4

Met Arg Lys Leu Ala Ala Leu Val Gly Gly Val Ser Asp Val Lys Gly  
 1 5 10 15

His Glu Asn Ser Leu Gln Ile Asp Asp Leu Ala Arg Phe Ala Val Asp  
 20 25 30

Asp His Asn Lys Lys Ala Asn Thr Leu Leu Gln Phe Lys Lys Val Val  
 35 40 45

Asn Ala Lys Gln Gln Val Val Ser Gly Thr Ile Tyr Ile Leu Thr Leu  
 50 55 60

Glu Val Glu Asp Gly Gly Lys Lys Lys Val Tyr Glu Ala Lys Ile Trp  
 65 70 75 80

Glu Lys Pro Trp Leu Asn Phe Lys Glu Val Gln Glu Phe Lys Leu Ile  
 85 90 95

Gly Asp Ala Pro Thr His His Ser Ala

100

105

&lt;210&gt; 5

&lt;211&gt; 927

&lt;212&gt; DNA

<213> *Castanea sativa*

&lt;400&gt; 5

atg aga atc tat gat ccg aat cag gct gtt cta caa gcc ctt aga ggc 48  
 Met Arg Ile Tyr Asp Pro Asn Gln Ala Val Leu Gln Ala Leu Arg Gly  
 1 5 10 15

tct aac att gaa gtc atg cta ggt gtc cca aac tca gac ctt caa agc 96  
 Ser Asn Ile Glu Val Met Leu Gly Val Pro Asn Ser Asp Leu Gln Ser  
 20 25 30

ctt gcc aac cct tcc aat gca caa gca tgg gta caa aga aac gta ctt 144  
 Leu Ala Asn Pro Ser Asn Ala Gln Ala Trp Val Gln Arg Asn Val Leu  
 35 40 45

aac ttc tgg cct agt gtc agg ttt cga tac att gca gtt gga aat gaa 192  
 Asn Phe Trp Pro Ser Val Arg Phe Arg Tyr Ile Ala Val Gly Asn Glu  
 50 55 60

gtg agt cct gtt aat gga ggc aca gct ggg tta gca caa att gtt ctc 240  
 Val Ser Pro Val Asn Gly Gly Thr Ala Gly Leu Ala Gln Ile Val Leu  
 65 70 75 80

cct gcc tta acc aac gta ttc aat gca att aga tca gct ggc ctt aag 288  
 Pro Ala Leu Thr Asn Val Phe Asn Ala Ile Arg Ser Ala Gly Leu Lys  
 85 90 95

gac caa atc cag gtt tca att gca att gac atg acc tta ata gga aac 336  
 Asp Gln Ile Gln Val Ser Ile Ala Ile Asp Met Thr Leu Ile Gly Asn  
 100 105 110

tcc tat cct ccg tca gca ggg gct ttc aga ggt gat gtt aga tca tat 384  
 Ser Tyr Pro Pro Ser Ala Gly Ala Phe Arg Gly Asp Val Arg Ser Tyr  
 115 120 125

tta gac cca atc att ggt cac cta gta tat gct aag gca ccc tta cta 432  
 Leu Asp Pro Ile Ile Gly His Leu Val Tyr Ala Lys Ala Pro Leu Leu

130                  135                  140

gcc aat gtg tac act tat ttt agc tat gct gga aat cca cgc gac att      480  
Ala Asn Val Tyr Thr Tyr Phe Ser Tyr Ala Gly Asn Pro Arg Asp Ile  
145                  150                  155                  160

tct ctt ccc tat gct ttg ttt act tcc cca tca gtt gtg gca tgg gat      528  
Ser Leu Pro Tyr Ala Leu Phe Thr Ser Pro Ser Val Val Ala Trp Asp  
165                  170                  175

ggt cct aag gga tac caa aac ctt ttt gat gca atg atg gat gca ttg      576  
Gly Pro Lys Gly Tyr Gln Asn Leu Phe Asp Ala Met Met Asp Ala Leu  
180                  185                  190

tac tca gct ctg gag agg tcg tgg ggc ggt tca ttg gag gtt gtt gtt      624  
Tyr Ser Ala Leu Glu Arg Ser Trp Gly Gly Ser Leu Glu Val Val Val  
195                  200                  205

tca gag agt gga tgg cca tca gca gca ggt gga ttc gct aca tca ttt      672  
Ser Glu Ser Gly Trp Pro Ser Ala Ala Gly Gly Phe Ala Thr Ser Phe  
210                  215                  220

gat aat gca cgt act tat tac tca aat ttg att aag cat gtc aaa ggg      720  
Asp Asn Ala Arg Thr Tyr Tyr Ser Asn Leu Ile Lys His Val Lys Gly  
225                  230                  235                  240

ggt aca cca aag agg cct ggg gga gct ata gag acc tat ctt ttt gcc      768  
Gly Thr Pro Lys Arg Pro Gly Gly Ala Ile Glu Thr Tyr Leu Phe Ala  
245                  250                  255

atg ttt aat gag aat cag aaa caa cca gag cta gag aaa aac ttt ggc      816  
Met Phe Asn Glu Asn Gln Lys Gln Pro Glu Leu Glu Lys Asn Phe Gly  
260                  265                  270

tta ttc ttc cca aat aaa cag ccc aaa ttt aac ctg aat ttt ggt gga      864  
Leu Phe Phe Pro Asn Lys Gln Pro Lys Phe Asn Leu Asn Phe Gly Gly  
275                  280                  285

gaa aga atc tgg gat gtc act gct gaa tat aat gca aca gtt tcc ctg      912  
Glu Arg Ile Trp Asp Val Thr Ala Glu Tyr Asn Ala Thr Val Ser Leu  
290                  295                  300

agt agt gat atg taa                  927  
Ser Ser Asp Met  
305

&lt;211&gt; 308

&lt;212&gt; PRT

<213> *Castanea sativa*

&lt;400&gt; 6

Met Arg Ile Tyr Asp Pro Asn Gln Ala Val Leu Gln Ala Leu Arg Gly  
1            5            10            15

Ser Asn Ile Glu Val Met Leu Gly Val Pro Asn Ser Asp Leu Gln Ser  
20            25            30

Leu Ala Asn Pro Ser Asn Ala Gln Ala Trp Val Gln Arg Asn Val Leu  
35            40            45

Asn Phe Trp Pro Ser Val Arg Phe Arg Tyr Ile Ala Val Gly Asn Glu  
50            55            60

Val Ser Pro Val Asn Gly Gly Thr Ala Gly Leu Ala Gln Ile Val Leu  
65            70            75            80

Pro Ala Leu Thr Asn Val Phe Asn Ala Ile Arg Ser Ala Gly Leu Lys  
85            90            95

Asp Gln Ile Gln Val Ser Ile Ala Ile Asp Met Thr Leu Ile Gly Asn  
100            105            110

Ser Tyr Pro Pro Ser Ala Gly Ala Phe Arg Gly Asp Val Arg Ser Tyr  
115            120            125

Leu Asp Pro Ile Ile Gly His Leu Val Tyr Ala Lys Ala Pro Leu Leu  
130            135            140

Ala Asn Val Tyr Thr Tyr Phe Ser Tyr Ala Gly Asn Pro Arg Asp Ile  
145            150            155            160



Ser Leu Pro Tyr Ala Leu Phe Thr Ser Pro Ser Val Val Ala Trp Asp  
165 170 175

Gly Pro Lys Gly Tyr Gln Asn Leu Phe Asp Ala Met Met Asp Ala Leu  
180 185 190

Tyr Ser Ala Leu Glu Arg Ser Trp Gly Gly Ser Leu Glu Val Val Val  
195 200 205

Ser Glu Ser Gly Trp Pro Ser Ala Ala Gly Gly Phe Ala Thr Ser Phe  
210 215 220

Asp Asn Ala Arg Thr Tyr Tyr Ser Asn Leu Ile Lys His Val Lys Gly  
225 230 235 240

Gly Thr Pro Lys Arg Pro Gly Gly Ala Ile Glu Thr Tyr Leu Phe Ala  
245 250 255

Met Phe Asn Glu Asn Gln Lys Gln Pro Glu Leu Glu Lys Asn Phe Gly  
260 265 270

Leu Phe Phe Pro Asn Lys Gln Pro Lys Phe Asn Leu Asn Phe Gly Gly  
275 280 285

Glu Arg Ile Trp Asp Val Thr Ala Glu Tyr Asn Ala Thr Val Ser Leu  
290 295 300

Ser Ser Asp Met  
305

<210> 7

<211> 732

<212> DNA

<213> Castanea sativa

&lt;400&gt; 7

atg aaa acc ctg gca ctc tac ggc ctt acc ttg gcc ttc ttt ttc tta 48  
 Met Lys Thr Leu Ala Leu Tyr Gly Leu Thr Leu Ala Phe Phe Phe Leu  
 1 5 10 15

tct ggt gca cac tct gct aaa ata act ttc aca aac aac tgt cca aga 96  
 Ser Gly Ala His Ser Ala Lys Ile Thr Phe Thr Asn Asn Cys Pro Arg  
 20 25 30

acc atc tgg cca gga acc cta act tcg gat caa aaa cct caa ctt tca 144  
 Thr Ile Trp Pro Gly Thr Leu Thr Ser Asp Gln Lys Pro Gln Leu Ser  
 35 40 45

aaa act gga ttt gag tta gca tcc aaa gca tcc tta aca ttg gaa tgt 192  
 Lys Thr Gly Phe Glu Leu Ala Ser Lys Ala Ser Leu Thr Leu Glu Cys  
 50 55 60

tca agc tcc atg gaa agg ccg gtt ttg ggc ccg aac ccg atg cac cac 240  
 Ser Ser Ser Met Glu Arg Pro Val Leu Gly Pro Asn Pro Met His His  
 65 70 75 80

caa atc agg aaa gtt cac ttg cga gac tgc tga ttg tag cac cgg tca 288  
 Gln Ile Arg Lys Val His Leu Arg Asp Cys Leu His Arg Ser  
 85 90

ggt tgc atg caa tgg taa ccg tgc aat ccc acc agc ttc ttt agt aga 336  
 Gly Cys Met Gln Trp Arg Cys Asn Pro Thr Ser Phe Phe Ser Arg  
 95 100 105

aat caa cat agc agc caa tcg tgg gat gga cta tta tga tgt tag cct 384  
 Asn Gln His Ser Ser Gln Ser Trp Asp Gly Leu Leu Cys Pro  
 110 115 120

tgt aga tgg ctt caa ctt gcc tgt ttc tgt agc cac cag agg ccg cac 432  
 Cys Arg Trp Leu Gln Leu Ala Cys Phe Cys Ser His Gln Arg Arg His  
 125 130 135

tgg tga ttg caa ggc cac aag ctg tcc agc taa tgt gaa cgc agt ttg 480  
 Trp Leu Gln Gly His Lys Leu Ser Ser Cys Glu Arg Ser Leu  
 140 145 150

ccc agc gga att aca agt gaa agg gtc tga tgg gag cgt gct tgc ttg 528  
 Pro Ser Gly Ile Thr Ser Glu Arg Val Trp Glu Arg Ala Cys Leu  
 155 160 165

caa gag cgc ttg tat tgc ttt caa tca acc aca gta ctg ttg cac tgg 576  
 Gln Glu Arg Leu Tyr Cys Phe Gln Ser Thr Thr Val Leu Leu His Trp  
 170 175 180

tgc att taa cac ccc gaa aac atg tcc acc cac aaa ata ttc tgc cat 624  
 Cys Ile His Pro Glu Asn Met Ser Thr His Lys Ile Phe Ser His  
 185 190 195

ctt taa gca aca atg tcc tca agc tta tag cta tgc tta tga tga tcc 672  
 Leu Ala Thr Met Ser Ser Ser Leu Leu Cys Leu Ser  
 200 205 210

tac cag cac ctt tac ctg ctc aag tgc acc cga cta tgt tat cgc att 720  
 Tyr Gln His Leu Tyr Leu Leu Lys Cys Thr Arg Leu Cys Tyr Arg Ile  
 215 220 225

ttg tcc ata aat 732  
 Leu Ser Ile Asn  
 230

<210> 8

<211> 226

<212> PRT

<213> Castanea sativa

<400> 8

Met Lys Thr Leu Ala Leu Tyr Gly Leu Thr Leu Ala Phe Phe Phe Leu  
 1 5 10 15

Ser Gly Ala His Ser Ala Lys Ile Thr Phe Thr Asn Asn Cys Pro Arg  
 20 25 30

Thr Ile Trp Pro Gly Thr Leu Thr Ser Asp Gln Lys Pro Gln Leu Ser  
 35 40 45

Lys Thr Gly Phe Glu Leu Ala Ser Lys Ala Ser Leu Thr Leu Glu Cys  
 50 55 60

Ser Ser Ser Met Glu Arg Pro Val Leu Gly Pro Asn Pro Met His His  
 65 70 75 80

Gln Ile Arg Lys Val His Leu Arg Asp Cys His Arg Ser Gly Cys Met Gln  
85 90

Trp Arg Cys Asn Pro Thr Ser Phe Phe Ser Arg Asn Gln His Ser Ser Gln  
100 105 110

Ser Trp Asp Gly Leu Leu Pro Cys Arg Trp Leu Gln Leu Ala Cys Phe Cys  
115 120 125 130

Ser His Gln Arg Arg His Trp Leu Gln Gly His Lys Leu Ser Ser Cys Glu  
135 140 145

Arg Ser Leu Pro Ser Gly Ile Thr Ser Glu Arg Val Trp Glu Arg Ala Cys  
150 155 160 165

Leu Gln Glu Arg Leu Tyr Cys Phe Gln Ser Thr Thr Val Leu Leu His Trp  
170 175 180

Cys Ile His Pro Glu Asn Met Ser Thr His Lys Ile Phe Ser His Leu Ala  
185 190 195

Thr Met Ser Ser Ser Leu Ser Tyr Gln His Leu Tyr Leu Leu Lys Cys Thr  
200 205 210 215

Arg Leu Cys Tyr Arg Ile Leu Ser Ile Asn  
220 225